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AUTHOR Riggs, Iris M.; Riggs, Matt L.
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ABSTRACT

The validity of several predictors was examined against multiple criteria of student program success. Subjects (N=437) were selected from about 800 students in the elementary teacher education program of a small California state university. Predictor variables for each subject included: (1) undergraduate grade point average (GPA); (2) subscale scores from the California Basic Education Skills Test; (3) prerequisite education course grades; and (4) composite scores from the National Teacher Examination (not available for all subjects). Criterion variables included: (1) grade in the curriculum and methods course taken during the last student teaching block; (2) two student teaching performance ratings; (3) positive and negative comments written on student teacher rating forms; and (4) successful completion of two quarters of student teaching. Multiple regression analysis enabled the assessment of the relative importance of the factors. The reading methods course grade and GPA functioned best as predictors of the performance criteria. Scores on the standardized tests were not significantly predictive. These results suggest that academic performance may be predictive of student teacher success, yet there is a need for further research. Three data tables are included. (SLD)

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A Test of the Validity of Selected Predictors of Student Success in a Teacher Education Program

Iris M. Riggs

Matt L. Riggs

California State University, San Bernardino

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Running Head: PREDICTORS OF STUDENT SUCCESS

There is growing interest in the validity of various measures used to predict student success in teacher education programs. More and higher admission standards have followed reform reports calling for higher quality teachers. Currently, a variety of criteria is utilized for admission to teacher education programs including grade point averages (GPA) and basic skills test scores, but little is known about the true objective value of these measures in reference to the selection of higher quality candidates.

In the California State University system, stricter standards were implemented in the form of higher GPA's, successful completion of the California Basic Educational Skills Test (CBEST), and passage of the National Teachers Exam (NTE), or an approved waiver program. Little research, however, has been done to examine the relationship between these scores and measures of subsequent student success. Limited studies that have attempted to investigate this question have provided mixed results.

In two studies conducted by Olstad (1983), GPA was identified as a predictor of success in student teaching performance, but the California Achievement Test was not found to be significantly related to performance.

Dobry, Murphy, and Schmidt (1985) investigated the NTE Test of Professional Knowledge as a predictor of student teacher competence as rated by cooperating teachers and found no statistical significance. There was also no significant

relationship between students' GPA and student teacher competence.

Demetrulias' (1989) study of admission requirements for a teacher education program reported no significant relationship between students exceptionally admitted and subsequent time spent with these students by university supervisors, university supervisors' evaluations, students' self-reports of preparation time, completion of program, or teaching credential acquisition. However, classroom teachers' assessments of exceptional admits were found to be significantly lower than those of regularly admitted students. Results regarding specific predictors were unavailable due to the multiple categories used to define exceptional admits.

The question of admission standards is critical to reform efforts. Given the mixed results of the limited studies addressing this issue, the current project attempted to provide further evidence toward the resolution of this important question.

METHOD

This study investigated the validity of several predictors against multiple criteria of student program success. Subjects (N = 437) were drawn from a population of approximately 800 students admitted to the elementary teacher education program of a small California state university. Measures obtained from student files included the following:

Predictor Variables - undergraduate GPA, subscale scores from the California Basic Education Skills Test, prerequisite education course grades (Educational Psychology and Reading Methods), and composite scores from the National Teachers Examination (available only for those students not classified as liberal studies majors).

Criterion Variables- Grade in the Curriculum and Methods course (taken during the last student teaching block), ratings of opportunities taken to demonstrate progress in student teaching skills (performance rating I), ratings of the demonstration of student teaching skills attained (performance rating II), the number of positive comments written on student teaching rating forms, the number of negative comments written on student teaching rating forms, and successful completion (passing) of two quarters of student teaching.

The ratings described above were provided by both university supervisors and cooperating teachers. Assessment forms utilized were completed at the end of each of two ten-week blocks of student teaching. The university supervisors' evaluations were based upon a minimum of five hour-long observations and pre/post conferences. Cooperating teachers' evaluations were done after daily observation and interaction with student teachers.

Competencies assessed are described in depth within a

Student Teaching Handbook that all supervisors, cooperating teachers, and student teachers utilize. The five categories assessed were: planning, instruction, evaluation, classroom organization, and classroom behavior (discipline). All categories were assessed for both individualized/small group instruction and large group instruction. Each category was rated with both of the following five-point scales:

Opportunities Taken (Performance Rating I):

1 Nearly all opportunities to demonstrate progress taken.
2 Most opportunities to demonstrate progress taken.
3 Some opportunities to demonstrate progress taken.
4 Few opportunities to demonstrate progress taken.
5 Opportunities to demonstrate progress seldom taken.

Attainment Demonstrated (Performance Rating II):

1 Functions independently on most goals at level of fully qualified teacher.
2 Functions independently on several goals with occasional supervision needed.
3 Functions adequately on several goals under supervision.
4 Has difficulty attaining several goals even under supervision.
5 Has been unable to attain most of the goals.

Evaluators were also given a space in which to write comments for each category. For this study, comments were read and classified by independent raters as either positive or negative in nature. Inter-rater reliability for 360 pairs of comment scores by two raters was $r = .92$.

Analysis

Previous investigations have often tested for predictor-criterion relationships with either Chi-square analysis or

analysis of variance, both of which required the categorization of what were originally measured as continuous independent variables. For example, one study trichotomized the continuous rankings of student teachers into "high, medium, and low" ranks to enable analysis of variance on group scores. This procedure reduces the power of such investigations because meaningful variance between members of each group is lost. If the range of the low ranking for 30 students is 21 to 30, students scoring anywhere within this range may now be assigned the score of "1". As a result, any meaningful covariance between their different rankings and the dependent measure is lost.

This study employed multiple regression analysis. This analysis is more appropriate given the nature of the predictor variables. It enabled the retention of the full range of continuous variance in these measures. In addition, inclusion of all predictors in a multivariate procedure enabled the assessment of the relative importance of each.

RESULTS

Means and standard deviations for variables used in the analysis are reported in Table 1. N's are also reported for each variable due to the great variance in availability of some of the data.

Because the variables Student Teaching I and II contained practically no variance (almost everyone passed), these variables were deemed inadequate and omitted from subsequent analyses.

Table 1: Descriptive Statistics

Variable	N	Mean	Std Dev
Predictor Variables (occur before acceptance into the program)			
GPA	429	3.08	.42
Ed Psych Class *	431	4.60	1.28
Reading Methods Class *	430	5.18	1.13
CBEST Reading	159	54.62	10.72
CBEST Math	159	56.36	10.36
CBEST Writing	159	48.72	9.71
National Teachers Exam	145	668.15	12.43
Criterion Variables (occur after acceptance into the program)			
Inst. Meth. Class *	408	4.82	1.15
Student Teaching I **	432	.99	.12
Student Teaching II **	431	.97	.17
Perf. Rating 1	122	13.88	5.29
Perf. Rating 2	122	14.81	5.56
# of Positive Comments	122	8.19	3.89
# of Negative Comments	122	.94	.42

* Scale used: A = 6, A- = 5, B+ = 4, B = 3, B- = 2, C+ = 1, C = 0
** Scale used: Pass = 1, Fail = 0 (Dummy Coded Variable)

Simple correlations between all variables are reported in Table 2. Pairwise deletion was used to maximize data available for each coefficient.

Simple correlations indicate that, with one exception, standardized test scores from the CBEST and NTE did not correlate with the criteria of program performance used in this study. The CBEST writing score did produce a correlation of $r = .24$, $p < .01$ with subsequent performance in the curriculum and methods course. GPA and grades from the educational psychology and reading methods courses produced consistent and significant correlations with grades from the curriculum and methods course and ratings of

Table 2: Pearson Correlation Coefficients

	GPA	Ed P	Read	CBR	CBM	CBW	NTE	Inst	P1	P2	Pos	Neg
GPA	1.00											
Ed Psy	.41	1.00										
Reading	.30	.27	1.00									
CBEST R	.20	.37	.07	1.00								
CBEST M	.21	.19	-.10	.40	1.00							
CBEST W	.30	.12	.07	.34	.19	1.00						
NTE	.27	.30	.08	.53	.53	.39	1.00					
Inst Meth	.29	.28	.21	.07	-.07	.24	.09	1.00				
Perf 1	.28	.26	.33	.08	.11	.07	.04	.18	1.00			
Perf 2	.28	.24	.37	.06	.10	.07	.02	.19	.95	1.00		
Positives	.06	.02	.05	-.02	.03	.06	.07	.05	.13	.10	1.00	
Negatives	.02	.09	.02	.04	-.01	.00	.02	.08	.23	.23	.77	1.00

student teaching performance. No predictor variables produced significant correlations with scores based on the number of positive or negative comments on the student teaching rating form.

An extremely high correlation was produced between the two performance criteria derived from student teacher performance ratings (r = .95, p < .001). This would indicate that the intention to produce two discrete factors failed, and both scores are providing essentially the same information.

The high correlation occurring between the number of positive and negative comments written (r = .77, p < .001) casts some doubt on the discriminant validity of these performance measures. Apparently, raters tended to either write comments (positive and negative) or they did not. Classifying and counting the number of positive and negative comments did not

appear to provide a meaningful measure of performance.

Predictor variables were entered into a separate stepwise regression analysis for each of the five performance criteria. Listwise deletion of cases with missing data was used, resulting in a final N of 120. Variables were entered until the proportion of additional variance accounted for in the dependent measure by the entering variable failed to reach significance.

As expected on the basis of the simple correlations reported above, no significant results were obtained for the two criteria based upon the number of positive or negative comments written on the student teaching rating forms. Results for the other three regression analyses are reported in Table 3.

Table 3: Regression Analyses

Analysis #1: Dependent Measure - Performance Rating #1

	Variable	R	R Sq	Adjst R Sq	Beta	T	Sig T
Step 1	Reading Meth	.33	.11	.10	.33	3.65	.000
Step 2	Reading Meth	.38	.14	.13	.27	2.88	.005
	GPA				.20	2.20	.030

Analysis #2: Dependent Measure - Performance Rating #2

	Variable	R	R Sq	Adjst R Sq	Beta	T	Sig T
Step 1	Reading Meth	.37	.14	.13	.34	4.19	.000
Step 2	Reading Meth	.41	.17	.15	.31	3.44	.001
	GPA				.18	2.02	.045

Analysis #3: Dependent Measure - Curriculum and Methods Course

	Variable	R	R Sq	Adjst R Sq	Beta	T	Sig T
Step 1	GPA	.29	.09	.08	.29	3.24	.002

Consistent with the results of the simple correlational analyses, standardized test scores from the CBEST and NTE did not function as significant predictors of program performance criteria. These scores failed even when selected as the initial variables in a forced entry regression analysis.

For both student teaching performance ratings, the grade received in the reading methods course was the first variable to enter the equation. The performance of this grade as a successful predictor of student teaching performance is somewhat surprising given that the mean score received in this class was 5.29 on a 6-point scale.

In both equations, undergraduate GPA accounted for enough unique variance in the criterion to enter at the second step. Using the adjusted R square as an estimate of variance accounted for, 13% and 15% of the variance in the respective dependent measures of student teaching performance was accounted for by the two predictors.

Though it produced significant simple correlations with both teaching performance variables, the grade received in the educational psychology class failed to account for enough unique variance to enter at a third step. This variable shared considerable variance with the GPA variable (r = .41, p < .001).

GPA was the best predictor of the curriculum and methods course grade, and was the only variable to enter this equation. Again using adjusted R square as an estimate of variance accounted for, GPA accounted for 8% of the variance in subsequent

grades in the curriculum and methods class.

DISCUSSION

The reading methods course and GPA functioned most successfully as significant predictors of the performance criteria. Scores on the standardized tests were not significantly predictive, even when these measures were forced to enter the regression equation first.

These results suggest that academic achievement may be predictive of student teacher success; however, the mixed results of studies cited earlier indicate the need for further research. Inconsistencies in the nature and quality of performance measures utilized from study to study may account for some of the confusion. For example, program completion has frequently been used as a performance criterion, but in many programs there is little meaningful variance in this measure because most students pass. Also, the "pass/fail" criterion lacks sensitivity due to the great variance in quality of performance that exists among students who "pass". The development of more reliable and valid indices of program performance will enhance our ability to assess the adequacy of our predictors.

The predictive power of the reading methods course may be the most interesting finding of this study. While many schools of education admit students before they have taken any methods courses, reading methods was required of all students in this study prior to their admission. This sequence provides a greater

richness of potential selection information. A typical educational methods course includes experiences which provide students with the opportunity to practice and demonstrate those skills which they will need as teachers. A field work component in an actual classroom is often part of the methods course. The use of methods course grades, work samples, and instructor/resident teachers' evaluations of both methods courses and field work could prove valuable as predictors of subsequent teaching success.

If subsequent research supports the use of higher academic admission standards for the selection of more capable candidates, this will raise potential questions with regard to minority preservice teachers. In research at Northern Arizona University, Morehead (1986) found that higher grade point requirements would severely limit the number of minorities eligible to enter the teacher education program. Academic performance should not function as the sole indicator of future success, though it may serve to identify students needing more support services as they complete their undergraduate program. Capable minorities must not be denied the opportunity to prove their worth in the classroom.

The failure of the standardized test scores (CBEST and NTE) to provide any meaningful information relative to subsequent performance as measured in this study must cause some concern. The use of admission requirements that show no relation to performance creates the potential for just litigation. Programs

utilizing scores on such tests as hurdles for entering candidates must be prepared to justify their use. Validity coefficients must support the expectation that these scores enable programs to select the best applicants, not just randomly reduce the pool. It may be time to give serious consideration to the nature of these tests, and why we should expect their scores to be predictive of subsequent teaching performance.

One potential explanation for the apparent invalidity of the standardized test scores in this study is that some restriction of range occurred due to the fact that students falling below the "cut point" on these tests were not admitted to the program and not part of the subject pool. This would reduce the magnitude of the correlation between these scores and subsequent performance if such a correlation existed, but a relatively small proportion of students was excluded. Sufficient variance existed in CBEST and NTE scores among the remaining participants to enable an adequate test of the relationship.

A second potential contributor to the weak performance of the standardized scores is the policy of this program that allows students who initially score low on these tests to retake them. Only the highest score is posted in the student's record. No indication of the coaching, preparation, or number of retakes needed to obtain that score is available.

The results of this study fall short of what is needed to confidently answer questions concerning valid selectors of candidates for teacher education programs. As in most studies of

this nature to date, the size of the sample is inadequate to provide the power desired in a selection validation study. A goal for researchers dealing with this question should be to collect thousands of cases from multiple programs using similar predictors and adequate measures of performance. Only then will we approach the final word on the nature and adequacy of currently employed selection variables.

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